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MORTALITY IN EGG-LAYING TRIALS IN GREAT BRITAIN DURING THE PERIOD 1929-1937

by

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The present paper is an abbreviation of a report submitted to the Poultry Technical Committee in 1938 giving the data of *post-mortem* examinations carried out at the Veterinary Laboratory, Ministry of Agriculture, Weybridge, on birds received from most of the county egg-laying trials in England and Wales, and from a number of open laying trials. The number of years for which records were available varied from county to county, but there were complete records covering the eight years from 1929-30 to 1936-37 for 15 counties. Five other counties had complete data for seven years, and four counties for six, and in addition there were a few other counties whose records did not cover consecutive periods over a number of years. In the original report tables were presented for all these various groups of counties, but the inclusion of all counties in any one year did not alter materially the percentages found in tables which were restricted to certain counties and years. For the sake of brevity, therefore, it is only intended to show here the tables for the 15 counties for which there was an unbroken record for eight years, and also the data for one open laying trial for which records were available for a continuous period of 13 years.

In the report submitted to the Poultry Technical Committee 42 tables were compiled, abstracts of the records having been made under the subdivisions of years, calendar months, breed and cause of death for the various groups of county and open laying trials. As previously mentioned, the figures for the various period groups of laying trials showed no appreciable difference, and there was no significant feature shown in the variation of the incidence of the different diseases in the main breeds. To reduce materially the length of this paper the bulk of these tables have been omitted, and only a few representative ones selected.

The initial classifications from the laboratory records were carried out by Dobson and Gordon, while the statistics were compiled by Dudley.

It will be advisable at the outset to consider some of the good points and also the weaknesses and limitations of the material available. One of the most important features of the diagnoses is that they were carried out at the same laboratory over a long period, with only a few changes in the personnel of the staff during the earlier years. On this account there is expected to be a certain stability in the methods of diagnosis and the results obtained.

The records have a further great value in that for most trials they provided a continuous description of the mortality over a number of years. In this respect they fell short of the ideal to some extent, since a few of the birds dying at the trials failed to reach the laboratory. For example, in distant trials in warm weather it is the practice not to send birds which die during the week-end, since putrefaction would probably occur, and in addition there are birds which die from accident, such as hanging in trap-nests, or by being killed by a fox, and deaths such as these are absent from the laboratory's records. As an offset to these deficiencies there were in certain cases a slightly greater number of birds examined than there were deaths in the trials. This was only detected when the birds were separately classified, for in the yearly table for all birds and counties, the number examined fell short of the number of deaths. There are two possible reasons for these discrepancies. In most counties the instructor is in charge of a flock of birds in addition to the trials. Birds sent from these flocks for examination may have been wrongly labelled, or in the absence of adequate description the laboratory may have assumed that such birds came from the trials. On the other hand, since in most cases there was a deficiency of examined birds among the main breeds, some mistake may have been made in the breed description in the records, or in the breed and county classification.

Table I shows the number of birds which died at the county egg-laying trials and the percentage examined at the laboratory. It will be seen that with the exception of 1929-30 over 80 per cent. of the birds which died at these trials each year were examined at the laboratory, so that the number of birds examined was sufficiently large to give a significant picture of the disease incidence.

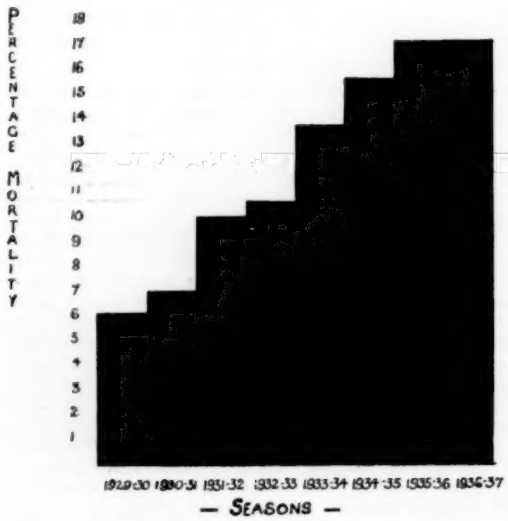
Table I

Number of Birds which died at County Laying Trials, the number and percentage examined at the Laboratory and the percentage mortality.

Year.	No. Entered.	No. Died.	No. Examined.	Per cent. Birds Examined.	Per cent. Mortality.
1929–30	3,619	226	145	64·2	6·24
1930–31	5,280	375	346	92·3	7·10
1931–32	7,011	710	589	83·0	10·13
1932–33	6,580	704	623	88·5	10·70
1933–34	6,438	888	823	92·7	13·79
1934–35	6,703	1,054	946	89·8	15·72
1935–36	6,971	1,204	1,141	94·8	17·27
1936–37	6,380	1,100	1,065	96·8	17·24

From the last column of Table I it will readily be seen that there has been a very steady increase in the mortality rate at the county laying trials over the period under survey, and this can be well illustrated graphically as in Table II.

Table II



This increase in mortality at laying trials is further emphasised by Table III, which shows the percentage mortality in all breeds and in each of the main breeds, at an open laying trial for which records were available over a period of eleven years, from 1924-25 to 1934-35.

It will be seen from Table III that the increase in the percentage mortality has been fairly constant in all breeds; but the death rate in Rhode Island Reds was in most years slightly lower than in other breeds.

In Table IV the percentage distribution of the various causes of death each year, in all breeds, in county laying trials for the years 1929-37 is shown. The diseases are classified under 20 headings, non-specific diseases under items numbers 1 to 10; tumours, lymphomatosis and allied disorders, numbers 11 to 13; and specific infections, numbers 14 to 20.

Table V (page 326) is similar to Table IV, and shows the percentage distribution of the causes of death each year in all breeds at a large open laying trial for which records are available for 13 years, 1924-37. It will be seen that the incidence of the various diseases is very similar to that at county trials.

Each of the important disease classes is discussed in the following paragraphs.

A.—NON-SPECIFIC DISEASES

1. Disease of the Reproductive System

The diseases of the reproductive system include chronic and acute egg peritonitis, internal laying, rupture of ova, impaction of the oviduct with inspissated egg material, rupture of the oviduct, etc., and accounted for more deaths than any other single class of disease. In 1929-30 the deaths under this heading constituted well over 40 per cent. of the total birds examined. During the next two years there was a slight decrease in this percentage which in 1931-32 reached 39·4 per cent. for all counties. In 1932-33 there was a substantial decrease to just below 30 per cent. and this level was maintained during the next two years, since when an appreciable reduction has been recorded, and in 1936-37 the percentage of the total mortality from this cause was only 20·3.

There were no very appreciable breed differences in respect of diseases of the reproductive system, although White Leghorns showed a tendency to be slightly more affected than the remaining breeds.

Table III

Year.	White Leghorns.	White Wyandottes.	Rhode Island Reds.	Other Breeds.	All Breeds.
1924–25	3·8	3·5	2·5	3·5	3·4
1925–26	9·3	3·3	2·9	7·6	6·1
1926–27	13·1	8·1	5·6	8·6	9·6
1927–28	9·1	6·3	5·1	7·2	7·1
1928–29	9·6	6·1	6·5	8·9	7·8
1929–30	16·7	12·4	10·3	15·3	13·8
1930–31	12·6	10·3	12·6	14·2	12·3
1931–32	18·2	18·6	13·2	10·9	15·4
1932–33	19·8	17·0	11·9	14·5	15·4
1933–34	24·6	21·1	13·7	17·6	17·8
1934–35	23·4	22·0	18·5	16·9	20·3

TABLE IV

Analysis of Post-mortem *Examinations carried out at the Ministry of Agriculture's Veterinary Laboratory, Weybridge, of Fowls received from County Laying Trials during the years 1929-37. (The columns A show the percentage mortality from various causes in the different years. In columns B the deaths from those causes each year are shown as percentages of the total mortality for that year.)*

	No.		1929–30		1930–31		1931–32		1932–33		1933–34		1934–35		1935–36		1936–37	
			A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
A. Non-Specific Diseases	1	Disease of Reproductive System	2·67	42·7	2·79	39·3	3·99	39·4	3·10	29·1	4·28	31·0	4·70	29·9	3·78	21·9	3·5	20·3
	2	Disease of Digestive System—																
		(*a*) Impaction ...	—	—	0·33	4·6	0·39	3·9	0·42	3·9	0·79	5·7	0·58	3·7	0·70	4·0	0·59	3·4
		(*b*) Enteritis	0·13	2·1	0·31	4·3	0·29	2·9	0·32	3·0	0·18	1·3	0·22	1·4	0·47	2·7	0·36	2·1
		(*c*) Internal Parasites...	—	—	0·02	0·3	0·02	0·2	0·19	1·7	0·57	4·1	0·69	4·4	0·55	3·1	1·28	7·4
	3	Disease of Respiratory System	0·30	4·8	0·10	1·4	0·72	7·1	1·07	10·0	0·41	3·0	0·38	2·4	0·39	2·3	0·27	1·6
	4	Disease of Urinary System (Visceral Gout) ...	0·13	2·1	0·51	7·3	0·29	2·9	0·57	5·3	1·01	7·3	1·21	7·7	1·45	8·4	1·18	6·8
	5	Disease of Circulatory System	0·04	0·7	0·18	2·6	0·19	1·9	0·28	2·6	0·10	0·8	0·20	1·3	0·48	2·8	0·93	5·4
	6	Disease of Liver (Infiltration, Degeneration or Rupture)	1·21	19·3	1·31	18·5	0·83	8·2	0·97	9·1	1·32	9·6	1·20	7·6	1·12	6·5	0·92	5·3
	7	General Emaciation ...	0·13	2·1	0·10	1·4	0·32	3·2	0·09	0·8	0·50	3·7	0·99	6·3	0·76	4·4	0·75	4·4
	8	Prolapsus of Oviduct or Intestines	0·13	2·1	0·09	1·2	0·15	1·5	0·12	1·1	0·30	2·2	0·17	1·1	0·24	1·4	0·15	0·9
	9	Undiagnosed or Decomposed Specimens ...	0·21	3·4	0·12	1·7	0·20	2·0	0·12	1·1	0·21	1·5	0·17	1·1	0·38	2·2	0·06	0·3
	10	Injury	—	—	—	—	0·03	0·3	0·02	0·2	0·06	0·4	0·05	0·3	0·03	0·2	0·04	0·3
B. Lymphomatosis and allied disorders	11	Tumour Formation—																
		(*a*) In Reproductive System	0·17	2·8	0·25	3·5	0·74	7·3	0·94	8·8	1·16	8·4	1·70	10·8	1·71	9·9	1·61	9·3
		(*b*) In other organs ...	0·73	11·7	0·41	5·8	0·62	6·1	1·36	12·7	0·84	6·1	0·58	3·7	1·09	6·3	0·59	3·4
	12	Neurolymphomatosis (Fowl Paralysis) ...	—	—	—	—	0·02	0·2	0·20	1·9	0·25	1·8	0·71	4·6	1·68	9·7	2·24	13·0
	13	Leukaemia	0·13	2·1	0·21	2·9	0·74	7·3	0·50	4·6	1·10	8·0	1·35	8·6	1·35	7·8	1·24	7·2
C. Specific Diseases	14	Coccidiosis	—	—	0·04	0·6	0·25	2·5	0·05	0·5	0·22	1·6	0·38	2·4	0·41	2·4	0·62	3·6
	15	Tuberculosis	0·26	4·1	0·33	4·6	0·29	2·9	0·36	3·4	0·41	3·0	0·36	2·3	0·64	3·7	0·89	5·2
	16	Fowl Pox	—	—	—	—	0·02	0·2	0·02	0·2	0·01	0·1	0·02	0·1	—	—	—	—
	17	Vent Gleet	—	—	—	—	—	—	—	—	0·03	0·2	0·05	0·3	0·02	0·1	—	—
	18	Fowl Cholera	—	—	—	—	—	—	—	—	0·03	0·2	—	—	—	—	—	—
	19	Fowl Typhoid	—	—	—	—	—	—	—	—	—	—	—	—	0·02	0·1	0·02	0·1
	20	Infectious Laryngotracheitis	—	—	—	—	—	—	—	—	—	—	—	—	0·02	0·1	—	—
		Percentage Mortality and Percentage of Total Mortality	6·24	100·0	7·10	100·0	10·10	100·0	10·70	100·0	13·78	100·0	15·71	100·0	17·29	100·0	17·24	100·0
		Number of Fowls Examined	145		346		589		623		823		946		1,141		1,065	

TABLE V

Percentage Distribution of Deaths each year, all breeds at a large open Laying Trial

	No.	Disease.	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32	1932–33	1933–34	1934–35	1935–36	193[illegible]
A. Non-Specific Diseases	1	Disease of Reproductive System	41·1	36·5	32·8	31·7	24·8	37·9	28·7	38·3	32·5	34·0	29·5	18·2	16
	2	Disease of Digestive System—													
		(*a*) Impaction ...	1·8	3·2	7·2	2·9	0·8	2·4	6·7	7·0	3·8	4·6	1·7	3·6	1
		(*b*) Enteritis	—	3·2	0·8	3·8	5·0	6·9	4·3	3·1	2·2	1·2	2·3	1·2	5
		(*c*) Internal Parasites...	1·8	3·2	—	1·9	—	—	—	0·7	3·2	2·7	2·1	0·4	1
	3	Disease of Respiratory System	10·7	7·9	10·4	12·5	7·4	5·6	2·8	4·5	7·0	2·9	3·6	4·0	3
	4	Disease of Urinary System (Visceral Gout) ...	1·8	4·8	9·6	5·8	2·5	2·8	15·4	3·5	8·9	9·0	6·9	8·9	6
	5	Disease of Circulatory System	1·8	3·2	2·4	5·8	5·8	2·8	1·6	3·1	2·2	1·5	0·6	4·4	6
	6	Disease of Liver ...	8·9	14·3	5·6	10·6	9·1	5·6	9·4	5·2	5·1	6·8	6·9	6·9	7
	7	General Emaciation ...	—	1·6	2·4	2·9	8·3	7·3	1·6	4·5	5·1	10·0	11·2	8·1	6
	8	Prolapse of Oviduct or Intestines	—	—	—	—	4·1	3·6	0·4	1·4	0·3	1·7	1·5	3·6	1
	9	Undiagnosed or Decomposed Specimens ...	7·1	—	4·8	7·7	3·3	1·2	3·9	3·1	3·5	2·2	6·1	2·4	2
	10	Injury	1·8	—	3·2	1·0	—	1·2	0·4	0·3	0·3	—	0·2	1·2	6
B. Lymphomatosis and Allied Disorders	11	Tumour Formation—													
		(*a*) Reproductive organs	3·6	11·1	5·6	—	3·3	4·8	3·5	5·2	7·6	9·5	4·6	6·9	8
		(*b*) In other organs ...	10·7	4·8	11·2	2·9	8·3	11·7	9·8	11·1	13·4	5·1	4·4	8·9	4
	12	Neurolymphomatosis (Fowl Paralysis) ...	—	—	—	—	—	—	—	—	1·3	1·2	1·3	5·7	8
	13	Leukaemia	5·4	3·2	0·8	1·9	5·0	3·6	2·4	4·2	1·0	5·3	5·5	9·3	3
C. Specific Diseases	14	Coccidiosis	—	—	—	—	—	0·8	2·4	1·7	—	1·5	1·9	2·0	3
	15	Tuberculosis	1·8	3·2	0·8	6·7	7·4	1·6	4·3	2·8	1·9	0·7	2·7	2·8	4
	16	Fowl Pox	1·8	—	1·6	1·9	5·0	—	1·2	—	0·3	0·2	—	0·4	—
	17	Vent Gleet	—	—	0·8	—	—	—	1·2	—	0·3	—	—	0·4	—
	18	Fowl Cholera											6·9	—	—
	19	Fowl Typhoid												—	—
	20	Infectious Laryngo-Tracheitis												0·8	1
			100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	10
		Number of Specimens ...	56	63	125	104	121	248	254	287	314	412	475	248	3

It is generally considered that egg peritonitis is due to a weakening of the reproductive organs consequent on heavy egg production over a prolonged period. This is borne out by the fact that many more deaths occurred from this cause in the second half of the year than in the first half, the proportions being approximately 70 per cent. and just under 30 per cent. respectively.

Table VI shows the percentage distribution from diseases of the reproductive system over the quarters of each year.

In different years the highest mortality from this cause occurred in May, June, July and August. The low figures for September are explained by the fact that in most years few birds were sent for examination in September when the trials close.

Egg peritonitis may be caused by injury due to careless handling or faulty trapnesting, and in many cases there was evidence that the condition was primarily due to degeneration of the ovary of the type usually associated with " carriers " of Pullorum disease.

TABLE VI

	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.	1936–37.
Oct., Nov. and Dec. ...	6·4	8·8	5·7	9·4	10·9	12·0	8·8	11·6
Jan., Feb. and Mar. ...	14·5	19·9	18·6	20·5	20·4	16·6	16·4	12·6
Apr., May and June ...	30·6	32·4	45·2	32·0	42·4	45·2	41·6	42·9
July, Aug. and Sept. ...	48·4	38·9	30·6	38·1	26·3	26·2	33·2	32·9

2. Disease of the Digestive System

(*a*) *Impaction.*—In 1929-30 there were no deaths from this cause, but in the next year 4·6 per cent. of the mortality was attributed to impaction and this has only been exceeded once in 1933-34. The cause in most cases was of a mechanical nature, the impaction being due to masses of matted coarse grass usually in the crop or gizzard. In certain cases it was associated with lymphomatosis, the nerves to the intestinal tract being involved. The losses in the different breeds from this cause were not significantly different.

(*b*) *Enteritis.*—The highest proportion of deaths from enteritis was recorded in 1930-31 when this cause was responsible for 4·3 per cent. of the deaths. After that time there was a decline to about 3·0 per cent. in the next two years and then to about 1·4 per cent. in 1933-34 and 1934-35, with a slight increase in the last two years. This condition is dealt with as distinct from inflammation of the intestinal tract due to parasitic infestation, and in most cases the cause was obscure.

(*c*) *Worm Infestation.*—Deaths from worm infestation are of fairly recent occurrence in these trials. In 1929-30 there were no deaths and in the next two years the mortality from this cause was negligible. In 1932-33, however, this condition became more evident and was responsible for 1·7 per cent. of the deaths. In the following year the proportion was more than doubled and again in the next year there was a slight increase to 4·4 per cent., and in 1936-37 the incidence reached 7·4 per cent. of the total mortality, or an actual percentage mortality of 1·28. Losses from this cause are principally due to infestations with *Ascaridia galli* (the large roundworm of poultry) and *Davainea proglottina* (the small tapeworm), and it is probable that in many cases the birds were already infested before arriving at the trials. Worms are found to some extent in a large number of the birds received from the laying trials, and we are of the opinion that they are not of pathological importance unless present in large numbers, or causing definite pathological changes in the intestinal tract. Therefore, deaths have only been included under this heading when the infestation has been sufficiently severe to cause pathological changes in the intestinal tract or associated with emaciation.

3. Disease of the Respiratory System

The proportion of deaths under this heading has varied considerably from year to year. In 1930-31 it was only 1·4 per cent. but in the next two years there was a considerable increase to 7 per cent. in 1931-32 and to 10 per cent. in the following year. In 1934-35 and 1935-36 the loss from this cause was only 2·4 per cent. and 2·3 per cent. respectively, and in 1936-37 it had dropped to 1·6 per cent. The high incidence of this condition in 1931-32 and 1932-33 can probably be explained by the occurrence of bad outbreaks of contagious catarrh at certain trials during these years. There was no significant difference in the breed susceptibility to disease of the respiratory system. It might have been expected that the majority of the deaths from this cause would have occurred in the winter months, but the percentage distribution over the months of the year shows that in the first three years most of the deaths occurred after February and in the last five years the deaths were spread over the whole year, about half of them occurring after March. The percentage mortality at laying trials from diseases of the respiratory system cannot be closely compared with their incidence on the average farm, where loss from contagious catarrh, colds, etc., is common, as the small units and relative isolation of the housing system at laying trials tend to prevent the spread of infection.

4. Disease of the Urinary System (Visceral Gout)

There has been a steady increase in the percentage of deaths from visceral gout and other diseases of the urinary system from 2·1 per cent. in 1929-30 to 8·4 per cent. in 1935-36 with a slight drop in 1936-37 to 6·8 per cent. The definite cause of the disease is still obscure but the condition does appear in many cases to be of dietetic origin.

5. Disease of the Circulatory System

This condition was responsible for only a very small proportion of the deaths and calls for no special comment.

6. Disease of the Liver

Diseases of the liver constituted one of the most important causes of death. In the first three years, and in 1933-34, they were second in importance to diseases of the reproductive system, but in 1932-33 they were fourth, and in 1934-35 fifth in order of importance. In the first two years diseases of the liver were responsible for nearly one-fifth of the deaths of the examined birds, in the next three years less than one-tenth, and from then onwards there was a considerable improvement in respect of the deaths under this group, and in 1936-37 they constituted only 5·3 per cent. of the total mortality.

The commonest condition of the liver found on *post-mortem* examination of birds from laying trials is a fatty infiltration with frequently a consequent rupture of the organ and internal haemorrhage. Fatty infiltration is considered to be associated with the feeding of a high carbohydrate ration, and it may be that certain birds are unable to assimilate as high a percentage of carbohydrates as others. The percentage of deaths from this disease was consistently higher for White Wyandottes than for any of the other breeds. Usually less than 10 per cent. of these deaths occurred during the first three months of the year, while during the next six months about 65 per cent. occurred. This monthly incidence is very similar to that for disease of the reproductive system and raises the question as to whether there is any physiological significance in the association of continued heavy production and fatty infiltration of the liver.

7. General Emaciation

A number of the specimens received from county laying trials show no definite cause of death apart from emaciation, usually associated with extreme atrophy of the visceral organs and unaccompanied by any parasitic infestation. Possibly some of these birds have been undergoing treatment in the laying trials hospital for some time, but quite a large number are received in the early part of the trials. Losses from this cause were confined in the first year to White

Leghorns and in 1930-31 to White Leghorns and Rhode Island Reds. The losses were not heavy over all the breeds until 1934-35 when 6·3 per cent. of the deaths were due to this cause. In the following two years the incidence was 4·4 per cent.

8. Prolapsus

The proportion of deaths from prolapse of the intestinal tract or oviduct was extremely small and showed no tendency to increase or decrease. Deaths from this cause never rose above 2·2 per cent.

9. Undiagnosed or Decomposed Specimens

These losses require little comment and are self-explanatory. On the average they comprised about 1·5 per cent. of the total mortality, the highest occurrence being in 1929-30 when they represented 3·4 per cent. of the total birds examined and the lowest 0·3 per cent. in 1936-37.

10. Injury

The losses from injury have never been greater than 0·4 per cent. of the birds examined; but it is probable that not all birds dying at the trials as a result of injury are sent to the laboratory for examination.

B.—LYMPHOMATOSIS AND ALLIED DISORDERS

11. Tumour Formation

(*a*) *In the Reproductive System.*—There were few deaths from this cause in the first year, 1929-30. In each successive year, however, there was a marked increase in the deaths from this cause, and in the years from 1932-37 it accounted for approximately 8 to 10 per cent. of the total yearly mortality.

There was no significant difference in the incidence of this disease in the various breeds and the deaths from this cause were distributed over the whole year.

(*b*) *In Other Organs.*—Tumour formation in organs other than the reproductive system accounted for a large number of deaths in the years 1929-30 and 1932-33, the percentage of the total mortality in these years being 11·7 and 12·7 per cent. respectively. In the intervening years and from 1933-37 the percentage mortality from this cause has varied from 3 to 6 per cent.

12. Fowl Paralysis (Neurolymphomatosis)

This disease did not make its appearance until 1931-32, when only one death was attributed to this cause. The number of birds dying from fowl paralysis increased each year and represented nearly 2 per cent. of the examined birds in 1932-33 and 1933-34, while in 1934-35 the proportion was 4·6 per cent. There was a further marked increase in the incidence of this disease in the years 1935-36 and 1936-37 to 9·7 per cent. and 13 per cent. of the total mortality. With the exception of Light Sussex no breed showed a definitely greater resistance or susceptibility to this disease than the others. In Light Sussex the condition was not diagnosed until 1935-36 when its percentage occurrence was approximately only half that in other breeds.

These two disease classes, tumour formation and fowl paralysis, might be grouped together, as following recent research certain workers on this subject hold the view that fowl paralysis is not in itself a disease entity, but is only one manifestation of a condition in which accumulations of lymphoid cells may occur in any of the tissues of the body. The condition has been named lymphomatosis and the term fowl paralysis (neurolymphomatosis) is now reserved for that form of the disease in which lymphoid infiltrations are found in the nerves. In the tables presented, with the exception of the last few years when routine histological examinations were carried out, only birds with macroscopic nerve lesions have been included under the title of fowl paralysis, and similarly no distinction has been made between lymphomatous type tumours and other neoplasms; so that the true incidence of lymphomatosis has been reduced by subdivision into fowl paralysis, tumours of the reproductive system and tumours of other organs.

During the seasons 1937-38 and 1938-39, in collaboration with county authorities, a survey of the incidence of fowl paralysis was carried out. It was found that lymphomatosis in all its forms occurred in approximately 28 to 30 per cent. of the fowls examined, and was easily the highest single cause of deaths in laying trials throughout these years. In other words, one out of every three birds which died at laying trials during the years 1937-38 and 1938-39 was affected with lymphomatosis, and this, in our opinion, is a fairer indication of the incidence of this disease throughout the country than figures for neurolymphomatosis alone in Table IV would suggest.

13. Fowl Leukaemia

In 1929-30 and 1930-31 there were relatively few losses from leukaemia, but in 1931-32 the proportion rose to 7·3 per cent. In spite of a substantial fall in the next year to 4·6 per cent., a still higher level was reached in the two following years, when the deaths

Table VII

Percentage of Deaths in each breed each year due to Neurolymphomatosis. All counties

	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.	1936–37.
White Leghorn	—	—	0·9	2·2	1·9	4·5	11·3	12·5
White Wyandotte	—	—	—	2·9	1·6	7·4	10·3	17·7
Rhode Island Red ...	—	—	—	2·2	2·4	4·1	9·5	12·9
Light Sussex	—	—	—	—	—	—	4·3	8·3
Other breeds	—	—	—	—	1·3	—	12·7	13·9
Total	—	—	0·2	1·9	1·8	4·6	9·7	13·0

from this cause were 8·0 and 8·6 per cent. respectively, while in 1935-36 and 1936-37 the percentage of the total mortality due to leukaemia remained at between 7 and 8 per cent. There was no apparent difference in the incidence of this condition in the varying breeds.

C.—SPECIFIC DISEASES

14. Coccidiosis

Coccidiosis was not responsible for many of the deaths at these trials. In 1929-30 there were no losses; in 1930-31 there were only two deaths and in 1932-33 only three deaths from this cause. In the succeeding years the losses from this disease varied from 2·5 to 3·6 per cent. of the examined birds, or a total mortality of only 0·62 per cent. The disease is not of much importance in laying trials and its incidence there is not comparable with that on the general farm. In most cases the disease was of the chronic caecal type and it is highly probable that the infection occurred before the birds reached the trials.

15. Tuberculosis

The proportion of deaths from tuberculosis was 4·1 per cent. in 1929-30 and 4·6 per cent. in the following year, but in subsequent years it was at a lower level and in 1934-35 was only 2·3 per cent. Unfortunately, the incidence increased to 3·7 and 5·2 per cent. respectively in 1935-36 and 1936-37. This disease calls for no special comment as most of the affected birds were probably in the early stages of infection on arrival at the trials and, as with coccidiosis, its occurrence cannot be compared with that on the general farm where, owing to the larger units and closer contact, there is more opportunity for the transmission of infection.

16-20. Other Specific Diseases

Fowl pox, vent gleet, fowl cholera, fowl typhoid and infectious laryngo-tracheitis were not of very great importance. In any one year the deaths from one of these diseases never exceeded 0·3 per cent. of the total mortality.

The notes above are based on the figures for county laying trials, Table IV, but it will be seen from Table V that the incidence of the various diseases was very similar at a large open laying trial; the only differences were that in the open laying trial there was an outbreak of fowl cholera in 1934-35, when this disease was responsible for 6·9 per cent. of the total mortality, and that in 1936-37 an outbreak of infectious laryngo-tracheitis accounted for 11·2 per cent. of the birds examined.

CONCLUSIONS

The most striking feature of this survey is the steady increase in the mortality rate at laying trials during the period under review. The following statement, Table VIII, shows the yearly incidence of mortality at four large egg-laying trials in Great Britain organised on a national basis.

In county egg-laying trials for which data are available the mortality has risen each year from 6·24 per cent. in 1929-30 to 17·24 per cent. in 1936-37, and has followed a similar course to the mortality at trial No. 1 in Table VIII. These data show that

Table VIII

Percentage mortality in four large Egg Laying Trials

Year.	Trial.			
	1	2	3	4
	Per cent.	Per cent.	Per cent.	Per cent.
1923–24	5·2	6·1	—	—
1924–25	5·0	5·4	3·4	7·5
1925–26	5·2	5·2	6·1	7·2
1926–27	4·1	6·6	9·6	7·0
1927–28	5·3	7·3	7·1	6·5
1928–29	6·8	7·1	7·8	5·5
1929–30	7·8	8·8	13·8	8·3
1930–31	7·9	10·7	12·3	9·0
1931–32	10·8	15·5	15·4	10·0
1932–33	11·2	14·8	15·4	9·6
1933–34	13·5	16·4	17·8	15·2
1934–35	14·8	20·0	23·1	17·3
1935–36	16·8	20·2	17·9	19·6
1936–37	17·5	21·3	21·2	19·6

although individual trials have differed from one another to some extent in respect of the mortality level, they have all followed a similar upward trend. Summarising the position in respect of all trials recognised by the National Poultry Council, the mortality has risen with almost consistent regularity from 6·6 per cent. in 1926-27 to 17·7 per cent. in 1936-37.

In the Report of the Poultry Technical Committee of Great Britain we find the following statement on mortality. "The picture of rising mortality among adult poultry as portrayed by these data is one of great seriousness. The birds purport to be from among the best flocks in the country; they have been selected and reared with great care, and when at the trials they are efficiently managed. In spite of these advantages, birds may die within a few weeks of entering the trials, and at the end of the period one out of every six is dead."

It is further stated in the report that surveys by Advisory Economists have shown that the increase in the laying-trials mortality is no isolated phenomenon peculiar to the trials, but has its counterpart in what is happening in the general flocks of the country. The Advisory Economist at Harper Adams Agricultural College has carried out an economic survey of commercial egg farms since 1930-31, and his results show that the percentage mortality based on the initial numbers of birds in the laying flocks increased from 9·4 per cent. in 1930-31 to 14·7 per cent. in 1936-37.

A memorandum on the Poultry Mortality in the United States of America was prepared for the Poultry Technical Committee of Great Britain by one of us (F. J. D.), and Table IX from this report is quoted (*over-leaf*) for comparison.

It will be seen that the mortality at laying trials in U.S.A. showed an even more serious increase than in this country. The high level of mortality in U.S.A. was reached some years ago, but there has been no strong tendency to an improvement in the situation.

When discussing these records it is necessary to remember that the figures, valuable as they are, refer to mortality at laying trials. They cannot be too closely compared with mortality on the farms of the owners who send stock to the trials. Birds sent to trials are

Table IX

Year.	Vineland.	Michigan.	Georgia.
1918–19	6·48	—	—
1919–20	10·45	—	—
1920–21	—	—	—
1921–22	11·25	—	—
1922–23	—	20·9	—
1923–24	24·58*	20·3	—
1924–25	16·84	17·8	—
1925–26	20·14	16·9	—
1926–27	25·17	16·9	14·0
1927–28	30·86	24·2	17·7
1928–29	23·61	—	22·8
1929–30	24·06	—	31·1
1930–31	30·32	—	26·6
1931–32	21·78	—	23·1
1932–33	25·99	—	25·4
1933–34	24·77	—	26·0
1934–35	21·20	—	26·6

* Epidemic of bronchitis.

usually specially selected from a good flock, are under observation during a selected period of life and housed under good conditions. Further, the conditions of housing in trials, in small, usually well isolated units, are such that they do not encourage the spread of infectious or contagious diseases. In consequence the largest percentage mortality in trials is due to diseases of non-specific type, while specific infections are of relatively little importance. An examination of the data reveals that failure or breakdown of the reproductive system was responsible for more deaths than any other single group of diseases; but this condition has decreased in relative importance, for whereas in 1929-30 it constituted 42·7 per cent. of the total mortality, the figure in 1936-37 fell to 20·3 per cent. Neurolymphomatosis (fowl paralysis), on the other hand, has increased in relative importance from 0·2 per cent. in 1931-32 to 13 per cent. in 1936-37. It is fairly safe to assume that if the term lymphomatosis had been used to include fowl paralysis, certain of the tumour formations (particularly those of the reproductive system), and possibly certain of the leukaemias, the incidence of this disease in later years would have reached 30 per cent. of the total mortality and would have represented the largest single cause of death. The other most important diseases were fatty infiltration and rupture of the liver, visceral gout, respiratory diseases, and tuberculosis. In Table X the diseases occupying the first five positions in their order of importance have been arranged for each year.

Summary

1. The data presented show that there has been a serious increase in the mortality rate at county laying trials in Great Britain from 6·24 per cent. in 1929 to 17·24 per cent. in 1937.

2. The bulk of the deaths were due to diseases of non-specific type, while specific infections and internal parasites were of relatively little importance.

3. The commonest cause of death was failure or breakdown of the reproductive system, followed by disease of the liver, visceral gout, and respiratory disease.

4. In recent years there has been a great increase in the incidence of lymphomatosis, which in the last year probably constituted the largest single cause of death.

Reference

[1]Report of Poultry Technical Committee of Great Britain, 1938. H.M. Stationery Office.

IMPORTANCE OF MILK RECORDING

A contributor writes, in a recent issue of *The Home Farmer*: "Drastic regulations are again affecting the milk producer. One of the most important is the slaughter policy of the Ministry of Agriculture to meet the beef and feeding-stuffs shortage. Dairy herds are to be combed out to remove some of the cows that are not giving an adequate return for the foods they eat. It seems a strange thing that such a regulation should be necessary, that any milk producer would be keeping cows that do not pay for their keep. Yet there are probably thousands of them!

"The only way to know accurately which cows are the profitable ones, and which are not really paying for their keep, is to keep milk records. The real test is how much milk the cow gives in twelve months. It is impossible to tell with any degree of accuracy unless it is known, day by day, how much she has given for the whole year, including the period during which she was dry. Some cows start off with a big yield, then diminish very rapidly, and in six months or less are practically dry. Another cow will start off with quite a moderate yield, but it is a job to dry her off before she calves again."

* * * * *

Weekly Wisdom

Who knows what mysteries are hidden within the nucleus of an atom, which, although a million million times smaller than the smallest living thing, is yet a universe in itself.—Louis de Broghie: "The New Physics," 1939.

* * * * *

Membership of the National Horse Association stands at 1,402, as against 1,531 in 1939. Income exceeded expenditure by £198, and investments, cash, and medals bring the assets to £1,792.

Table X

Disease.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.	1936–37.
Reproductive System ...	1	1	1	1	1	1	1	1
Disease of the Liver ...	2	2	2	4	2	5	—	—
Tumour Formation ...	3	4	3	2	3	2	2	3
Respiratory Disease ...	4	—	5	3	—	—	—	—
Tuberculosis	5	5	—	—	—	—	—	—
Visceral Gout	—	3	—	5	5	4	4	—
Leukaemia	—	—	4	—	4	3	5	5
Fowl Paralysis	—	—	—	—	—	—	3	2
Internal Parasites	—	—	—	—	—	—	—	4

THE VETERINARY RECORD

June 7th, 1941.

MORTALITY IN LAYING TRIALS

EGG laying trials throughout the country, in addition to their value in showing the performance of groups of different breeds and strains of fowls, are also of importance from the point of view of assessing the general health of poultry stocks throughout the country. Records of mortality and its causes are particularly valuable, for they show the trend of disease incidence from year to year. The article by Dudley, Dobson and Gordon, published in this issue of *The Veterinary Record*, points clearly to the high death-rate and the general increase of disease among poultry during recent years. This is in keeping with the results of general observations throughout this country, and published records from other countries, especially America, show that these findings are not confined to Great Britain.

The increase of the mortality rate at county laying trials in Great Britain from 6·24 per cent. in 1929 to 17·24 per cent. in 1937 requires some explanation. Table X in the article is of considerable importance, in that it shows how the diagnosed disease causing the highest mortality has varied from year to year. Generally speaking, it would appear that this increase was due to lymphomatosis and allied disorders and to diseases of non-specific type of which diseases of the liver, visceral gout, etc., were the most commonly recorded. Lymphomatosis, under which term may be included true fowl paralysis (neuro-lymphomatosis) and many of the tumour formations, has certainly increased in recent years. It is only quite recently that we have ascertained its true nature and its possible causes: the application of this knowledge in methods of control may lead to a reduction in its incidence in future years.

It is true that the actual causes of some of the diseases of poultry are not yet thoroughly understood. We still record *post-mortem* findings as enteritis, disease of the liver, general emaciation, etc., and we accept these terms as indicating diseases from which the fowls suffered and which caused their deaths. As research work continues we obtain a more accurate understanding of the various causes of such general conditions and are thus able to define with greater precision the true nature of the affection, its actual cause and its prevention. There is little doubt that the highly artificial life which poultry must lead to-day in order to produce economically is largely responsible for much of the prevalent mortality as recorded at laying trials and in flocks throughout the country.

Internal parasites must always be considered in relation to health, disease and mortality in livestock and this applies equally to poultry. It is possible that a true indication of their effect on the health of fowls at the laying trials may not be forthcoming from the records contained in this article, as some time must have elapsed between the death of the bird and its *post-mortem* examination.

There is still need for greater research efforts in diseases of poultry. During recent years much has been accomplished, but there still remain many diseases, especially of the non-specific type, which are only imperfectly understood. Now that the policy is to give preference in food supplies to sound breeding stocks, it is the duty of all concerned and especially the veterinary profession to apply all the available knowledge in the control of disease generally and to intensify research into the cause of mortality with a view to the elaboration of further methods of prevention.

GAS CONTAMINATION OF FOOD

The Ministry of Food has issued to the food trades and those responsible for the storing of food supplies, the following instructions as to the action which should be taken for the protection of foodstuffs against contamination by poison gas:—

The risk that foodstuffs may be contaminated by poison gas is a real one. Those responsible for the handling of food should be fully alive to the danger. Contamination may remain undetected for a time and lead to considerable loss of foodstuffs unless every precaution is taken.

Gas sprayed from aircraft may take 20 minutes or half an hour to fall. It will be very difficult to say where the danger will be or for how long it will last. Foodstuffs exposed in the open may be seriously contaminated.

Foodstuffs should be protected continually, therefore, especially where they are not in cans or other sealed containers. *Meat, sugar, grain, flour, fats, bread, fruit, vegetables, feeding-stuff, etc., must be kept covered at all times.*

Wherever possible foodstuffs should be kept under shelter and not stacked in the open. They should be given protection during handling at every point where they are normally exposed in the air. The only safe rule is to keep foodstuffs covered continually.

Tarpaulin sheets of the oil-dressed type offer the best temporary protection for foodstuffs in the open and should be used wherever possible. If these are not available, screens should be improvised with canvas, sacking, corrugated iron, etc.; if possible, these screens should not be in direct contact with the foodstuff. Anything which gives shelter will help to guard against the danger of contamination.

In warehouses, etc., foods in sacks or other permeable containers should, wherever possible, be stored in middle floors and away from windows. Additional protection can be given to a stack by the use of tarpaulin covers or screens of canvas, etc. Meat inside cold stores and refrigerators is perfectly safe from poison gas.

The greatest caution is essential; lack of preparation may cause endless trouble. Loose waterproof sheets or other covers should always be kept at hand, and not wasted on work less important than the protection of food supplies.

If food is affected by poison gas, it should be examined by the authorised officer of the local authority, who will decide whether it can be decontaminated on the spot, or if it is necessary to remove the food for decontamination elsewhere or for destruction.

* * * * *

Mr. L. Lord, formerly Divisional Agricultural Officer, Ceylon, has been appointed Secretary to the Colonial Advisory Council of Agriculture and Animal Health and Assistant to the Agricultural Adviser, Colonial Office.

CLINICAL COMMUNICATION

Notes on Some Recent Anthrax Cases

NORMAN P. MALE, B.Sc., M.R.C.V.S., D.V.S.M.
READING

CASE NO. 1

Subject.—Eight weeks' old Crossbred Large White and Wessex sow pig in good condition.

History.—The owner found the pig dead one morning, and putting it in the back of his car brought it in for a *post-mortem* examination. The dam of this pig and another sow had died about a week previously and had been buried. All these animals were running in the same field.

Post-mortem Findings.—As a routine procedure in all *post-mortem* examinations on pigs, an incision is made in the throat region first. In this case the procedure was amply justified. No marked swelling was observed but, subcutaneously, the typical pale yellow exudate was found. A smear was made from this exudate and from the cut surface of the submaxillary lymphatic gland. *B. anthracis* was found in both slides, but the bacilli were more numerous in the gland smear than in the exudate.

Remarks.—Several other pigs developed marked swellings in the throat but they all recovered after a temporary malaise. The pigs were fed on maize meal, middlings, bran and whale meal. No foreign litter had been used and no known death from anthrax had occurred on the farm.

CASE NO. 2

Subject.—A six weeks' old Wessex Saddleback sow pig in good condition.

History.—The pig was found dead one morning and the owner, following the procedure of the farmer in the first case, put it in the back of his car and brought it in for a *post-mortem* examination.

Post-mortem Findings.—Swelling in the throat region, subcutaneous yellow exudate; *B. anthracis* was found in a smear from the submaxillary lymphatic gland.

Remarks.—The pig had been fed on a product known as "Seemeal." The owner had a large quantity of this and a representative sample was examined for the presence of *B. anthracis*. The result was negative. No further cases occurred and no anthrax had previously occurred on the farm.

CASE NO. 3

Subject.—A Red and White Shorthorn bull calf, four months old.

History.—The calf was found dead one morning in its pen, where there were three other calves which were quite healthy.

Post-mortem Findings.—As death was so sudden, the case was treated as suspected anthrax. The carcase was tympanitic but otherwise appeared normal. A blood smear revealed the presence of *B. anthracis*.

Remarks.—None of the other three animals was taken ill and they remained healthy. They had been in the same pen since birth and had been fed on calf meal and calf nuts. Anthrax had not occurred at the farm previously.

CASE NO. 4

Subject.—Ayrshire bull calf, three months old.

History.—The calf was found dead in a pen.

Post-mortem Findings.—The usual tympany was present and there was also an extravasation of blood from the nostrils and from the anus. *B. anthracis* was found in a blood smear.

Remarks.—The calf had been in a pen for two months and had been fed on linseed cake, ground nut cake, flaked maize and bran. No other animals were taken ill and anthrax had not occurred at the farm previously.

The reason for recording these cases is not that they are unique but to draw attention to the prevalence of the disease in young animals, especially those which have been housed, where no suspicious history is present. This indicates the advisability of a routine examination for anthrax in all cases of sudden death.

In each case it is probable that the feeding stuffs had become contaminated. It is also interesting to note that in Case No. 1 several other pigs presumably contracted anthrax but recovered.

ABSTRACTS

[STREPTOCOCCUS INFECTIONS IN DOGS. MINETT, F. C., and ELLIS, A. A. B. (1940.) *Vet. J.* **96.** 438.]

The main object of these investigations was to test the efficacy of drugs of the sulphonamide group on streptococcal infections in dogs. Other workers have recorded the isolation of haemolytic streptococci from various situations in dogs, including the vaginae of bitches, and lungs and other organs of pups dying soon after birth; and from cases of abortion, sterility, septicaemia, pneumonia and tonsillitis. Here the authors deal with the most frequent manifestation of the infection, in the genital tract of bitches, and in the skin.

A common indication of infection is that an apparently healthy bitch fails to rear a litter, the loss often being unjustifiably attributed to "acid milk." The bitch may fail to conceive, or may show signs of "phantom pregnancy." Abortion may be an indication of streptococcal infection. Some bitches are reported "out of sorts" with symptoms including slight fever, diarrhoea and cough. Occasionally the malignant "puerperal" form may kill the bitch a few days before or immediately after whelping.

Some pups are born normal and appear to thrive for two to five days, after which they stop sucking and die. Prior to death reddish or purple spots may appear on the abdomen and the navel looks unhealthy. Other pups remain apparently healthy for a month or so, then go "off colour" and die within a day or two.

The modes of spread of the disease are still uncertain. The most obvious way is by the "healthy" carrier bitch. The male may maintain infection by transmitting the disease venereally, since in a few instances culture from preputial swabs has revealed streptococci. These organisms have also been isolated

from the tonsils of both sexes. In one case streptococci were isolated from the milk of an infected bitch.

The disease is widespread among a variety of breeds, and the financial loss to owners by death of pups and failure to conceive is considerable.

Positive diagnosis can only be made by isolation of haemolytic streptococci from vaginal swabs, or dead pups. While a positive vaginal swab is conclusive evidence of infection, less reliance is placed on a negative result. It is important that great care be taken to avoid faecal contamination when taking vaginal swabs. Hair around the vulva should be carefully clipped, the external genitalia must be thoroughly cleansed with soap and water; finally, the interior of the vulva, as far as and including the urethral orifice, must be gently wiped with a tampon of cotton wool soaked in alcohol. (The use of any other disinfectants must be avoided in the cleaning.) The lips of the vulva are everted by the left hand and the swab passed in with a rotating movement up to the cervix uteri and then withdrawn. Passing the swab may be facilitated by first inserting hind foremost a clean clinical thermometer. It appears quite safe to swab the vaginae of pregnant bitches if care is taken.

Laboratory examination of the swabs is made by plating saline dilutions of washings from them in ox blood agar.

Attempts to treat carrier bitches with sulphanilamide and M & B 693 were unsuccessful, though good levels of blood concentration were reached. Sometimes streptococci disappeared from the vagina for a few days but later reappeared in large numbers. Subsequent courses of treatment were equally unsuccessful. It is possible that among the related sulphanilamide preparations now being synthesised some may prove more effectual for the purpose. As chemotherapy usually gives the best results in acute stages the streptococci might prove more amenable to treatment during the "puerperal stage," and favourable reports have been given of treating for five days before and after whelping. Another line of treatment that might be explored is combined specific immunisation and drug therapy.

Meanwhile owners are advised not to introduce new bitches into breeding kennels unless two vaginal swabs at a few weeks interval have given negative results, though these do not guarantee freedom from infection.

Dogs suffering from chronic suppurative dermatitis and interdigital cysts due to streptococcal infection were equally unresponsive to treatment with sulphanilamide and M & B 693.

While there is little doubt that streptococci are responsible for the genital conditions, some haemolytic streptococci have been isolated from animals showing no greater abnormality than irregularity in oestrus. The number of Group G strains obtained from various sources suggests a single streptococcal infection with differing clinical manifestations, such as occurs in man.

The mode of infection in pups is still obscure; various possibilities, such as infection *in utero*, during passage through the genital canal, via the milk and by licking, all need further observation.

A. E. K.

[TUBERCLE BACILLI IN MEAT AFTER STRIPPING OF TUBERCULOUS SEROUS MEMBRANES. Brandt and Hulphers. (1939.) *Z. Fleisch-u. Milchhyg.* **50**. 2. 21-2.]

Some experiments with the scrapings of superficial musculature, after stripping tuberculous pleural and peritoneal membranes, were carried out at the Stockholm Veterinary College, material being obtained from the local abattoir. Guinea-pig inoculations were carried out and the animals killed and examined from six weeks to two months later. In all, 61 cases were examined, 39 pleural and 22 peritoneal. Positive results were obtained in 23 pleural (58·9 per cent.) and 12 peritoneal (54·5 per cent.) instances. In more than 50 per cent. of such cases tubercle bacilli were recovered from the guinea-pig lesions, and bacilli were more numerous from cases derived from carcases in the cooling rooms than from those coming direct from the slaughtering hall.

D. J. A.

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[TREATMENT OF SO-CALLED NECROTIC ENTERITIS OF SWINE WITH NICOTINIC ACID. Hastings, C. C. (1940.) *N. Amer. Vet.* **21**. 724-726.]

The author briefly reviews the types of enteritis which exist in pigs and points out that necrotic enteritis is not necessarily a disease which occurs where sanitary conditions are bad. Cases are described where the author has given nicotinic acid daily in the feed in 60 mgm. doses for pigs nine weeks old up to 150 mgm. for adult pigs. He concludes that nicotinic acid exerts a definitely favourable influence on the sub-acute form of enteritis, commonly called "necro." He considers that this agent is of little, if any, value in treating haemorrhagic dysentery. The necessity of treating cases in the early stages of the disease is emphasised.

D. W. M.

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[INEFFECTIVENESS OF PROPRIETARY REMEDIES AND OTHER DRUGS IN THE CONTROL OF BANG'S DISEASE, WITH SPECIAL REFERENCE TO "3-V TONIC" AND "BOWMAN'S." Crawford, A. B., and Beach, B. A. (1940.) *J. Agric. Res.* **60**. 565.]

An account is given of experiments designed by the Bureau of Animal Industry and by the University of Wisconsin to test the validity of claims made by the owners of two proprietary products in the successful prophylaxis and cure of *Br. abortus* infection in cattle. The results obtained from these well-controlled experiments show that the products were valueless in both respects.

S. J. E.

A 22-page booklet on the cultivation of medicinal herbs has been published by the Ministry of Agriculture and Fisheries (H.M. Stationery Office, price 6d. net). Details are given of 16 cultivated herbs, nine wild herbs and seven herbs which yield oil-containing seeds. The types of soil required, the time of cropping, the parts gathered and where applicable the B.P. specifications are included, and there are also hints on the most suitable fertilisers. Unlike the earlier bulletin, "Herbs," from which much of the information has been derived, the present edition contains no illustrations.

IN PARLIAMENT

The following are among the questions and answers recently recorded in the House of Commons:—

Feeding-stuffs

Mr. Goldie asked the Parliamentary Secretary to the Ministry of Food whether he is aware of the grave financial loss, including the destruction of horses, inflicted upon the proprietors of riding schools throughout the country by the refusal of his Department to authorise the issue of rationed feeding-stuffs to them; and whether, as such establishments provide the means of obtaining healthy exercise by war workers and others, he will arrange for the transfer to such riding schools of a portion of the feeding-stuffs now allocated to racing stables?

Major Lloyd George: I regret the consequences of stopping the issue of rationed feeding-stuffs for riding horses, but it is not possible, in view of the present supply position, to modify this decision. The quantity of feeding-stuffs allocated to racehorses whilst in training is relatively very small and it would not be practicable even were it expedient, to divide this small quantity amongst all the owners of riding stables.

. . . . .

Livestock (Slaughter Licences)

Mr. H. B. Taylor asked the Parliamentary Secretary to the Ministry of Food the number of permits issued by local food officers to private individuals to slaughter and consume their own fed livestock, beasts, sheep, calves and pigs since the commencement of the order up to April 30th, 1941?

Major Lloyd George: Particulars of the number of licences issued by food executive officers authorising individual producers to slaughter calves, sheep and pigs for consumption in their own households prior to the beginning of the present year, are not available. For the months of January, February, March and April this year the total number of licences issued was: calves 113, sheep 1,214, and pigs 152,479. Licences are not issued to authorise the slaughter of beasts by private individuals.

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Meat for Dogs

Mr. R. De la Bere asked the Parliamentary Secretary to the Ministry of Food whether he is aware that, in view of the price obtainable for meat classified as unfit for human consumption which is provided for dogs and for which up to 1s. 4d. per lb. is obtainable, some farmers find it more profitable to classify their animals as unhealthy and so obtain a better price than by selling them for human consumption.

Major G. Lloyd George: I am aware that dogs' meat is being sold to owners of dogs at high prices and that some cows which might be fit for human consumption may be finding their way to knackers' yards for this trade. Measures to prevent any abuse of this kind are at present being examined. The prices of lower grade cows have recently been increased.

COLONIAL DEVELOPMENT

Lord Moyne, Secretary of State for the Colonies, said at a luncheon of the Over-Seas League in London recently that the Prime Minister had consented to reopen the policy of development and welfare work in the Colonies, which it had been decided was out of the question financially after the defection of France last year. Lord Moyne hoped that, with advantage to our war effort, we would be able to go ahead with planning improvement in the Colonies.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 9th.—D.V.S.M. Examination at Glasgow Veterinary College.
June 18th.—Meeting of the Ayrshire Division, N.V.M.A., at Ayr, 2.30 p.m.
June 19th.—Meeting of the N.V.M.A. Finance and General Purposes Committee, Royal Station Hotel, York, 2.30 p.m.
June 19th.—R.C.V.S. Committee Meetings, Royal Station Hotel, York.
June 20th.—R.C.V.S. Annual General Meeting, Royal Station Hotel, York, 12 noon.
June 20th.—R.C.V.S. Committee and Council Meetings, Royal Station Hotel, York.
June 20th.—Victoria Veterinary Benevolent Fund Annual General Meeting, Royal Station Hotel, York, 12.30 p.m.
June 26th.—R.C.V.S. Written Examination begins.
June 30th.—R.C.V.S. Oral and Practical Examination begins.

N.B.—The special meeting of Council, N.V.M.A., announced in our last issue as being held at Tamworth on June 6th, at 2.30 p.m., will take place at **York** on the same day, at the Royal Station Hotel.

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PERSONAL

The Royal Society for the Prevention of Cruelty to Animals has announced the award of its silver medal for Animal Life Saving to Mr. W. A. S. Stevens, M.R.C.V.S., for a gallant effort—in conjunction with Inspector P. Cosway of the R.S.P.C.A., who also receives the award—which resulted in the rescue of eight horses in a recent raid on Southsea. Stables containing 14 horses had received a direct hit from a high explosive bomb. With enemy action continuing, these helpers, working in almost total darkness, tunnelled through the debris and brought the surviving horses to safety under circumstances of the greatest danger and difficulty.

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Birth.—Simpson.—On May 26th, at Carmarthen Infirmary, to Joan, wife of J. W. Simpson, B.Sc., M.R.C.V.S., a son.

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Retirement.—Mr. William White, M.R.C.V.S., has retired from his service with the Birmingham Corporation because—as we learn with much regret—of ill-health. Mr. White has been associated with the Veterinary Department for 30 years, and during the last 20 years has been chief assistant veterinary officer.

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GENERAL OBITUARY

Dr. W. Lewis Davies

We regret to record the death in India, at the early age of 46 years, of William Lewis Davies, D.Sc., Ph.D., F.I.C., a leading authority in analytical chemistry in the field of dairy research.

Dr. Davies went to Reading in 1925, when he joined the staff of the University as Advisory Agricultural Chemist. In 1927 he was appointed Biochemist at the National Institute for Research in Dairying. His researches on the constitution of proteins and the chemistry of milk and milk products were recognised in 1935 by the conferment of the degree of D.Sc. by the University of Wales. In 1939 he was appointed the first Director of Dairy Research to the Government of India.

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NATIONAL HORSE ASSOCIATION

Presentation of Bravery Awards

An interesting outdoor ceremony took place in the Trinity House Gardens, Tower Hill, on Wednesday, May 28th, when Frances Lady Daresbury presented a

number of awards to men who had risked their lives to save the life of horses during recent air raids.

Lady Daresbury was supported by Mr. Claud F. Goddard, Mr. R. S. Summerhays, Mr. W. S. King and other members of the Council of the National Horse Association, the Rt. Hon. Thomas Wiles, P.C. (Chairman of the Port of London Authority), Col. R. J. Stordy (Chief Executive Officer of the National A.R.P. Animals Committee), and a large gathering of the general public.

The first recipient was Station Officer G. E. Switzer, of the London Fire Brigade, who received the National Horse Association's Silver Medal and Bravery Merit Certificate for directing and organising the rescue of 39 horses when stables were set alight near the London Docks. The horses were on the first floor with a large forage store above, which soon became a raging inferno. Officer Switzer collected a party and removed all the horses to safety. The task was rendered very difficult owing to the frightened state of the animals, and the fact that high explosive bombs fell in the vicinity. The energetic and inspiring leadership of Officer Switzer was specially commented upon by all witnesses and by his various helpers in the task.

These helpers were then presented and received framed Merit Certificates, *viz.*, P.Cs. F. S. Morris and R. C. Barrow, Henry Murray and W. Tillcott of the A.F.S., Mr. A. Clarke (Horsekeeper), and Messrs. J. Day, A. Gudge and H. Richards (Fire Watchers).

The Secretary then announced that Mr. F. Coe, Mr. D. Rogers and Mr. F. Neame, of Messrs. Mann, Crossman & Paulin, had been awarded Merit Certificates for assisting to rescue 90 horses from burning stables, but that he regretted to say that these men were still in hospital as a result of air raid injuries. A representative of the firm, therefore, received the awards on their behalf.

Merit Certificates were also awarded to Mr. H. Evans for organising the rescue of 33 horses from a demolished stable at Spitalfields, Mr. G. Wiseman for organising the rescue of 50 horses from burning stables—next to a burning gas main—at Bow Common, and Mr. Godfrey for rescuing 11 horses from a demolished stable at Stepney.

At the conclusion of the ceremony the Rt. Hon. Thomas Wiles expressed the thanks of the recipients to Lady Daresbury and the National Horse Association for thus recognising the bravery displayed in saving the life of horses.

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LEGAL NOTES

Unlawful Use of Title.—For unlawfully using the description of "veterinary surgeon," Eric Thomas Pike, of Oswaldtwistle, was fined 10s. and ordered to pay £2 17s. 6d. costs at Blackburn County Police Court on May 21st.

Mr. J. W. Booth, of Oswaldtwistle, prosecuted for the Royal College of Veterinary Surgeons.

It was alleged that in an application for a supplementary petrol allowance defendant described himself as "veterinary officer."

Mr. A. B. Roebuck, for defendant, said he had no intention to mislead anyone. For many years he was in charge of the dispensary for sick animals of the poor, and at present he was in charge of a similar clinic in Eanam. He had received a letter from a Chief Constable thanking him for his services on one occasion, in which the "Chief" described him as "veterinary officer." In applying for petrol he thought this description less clumsy than, say, "superintendent of sick animals clinic." He had no idea he was committing an offence.

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£100 *Fine for Failure to Notify Foot-and-Mouth Disease.*—Mrs. Annie Aston, a Cheshire farmer, of Newton Farm, Newton-by-Tattenhall, was fined £100 and ordered to pay £18 costs at Broxton Petty Sessions for failing to give notice of foot-and-mouth disease at her premises between March 22nd and April 18th.

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A Cheshire farmer challenged the right of a veterinary inspector to enter his premises when he had as alleged come direct from an outbreak of foot-and-mouth disease. It was stated that the inspector produced the proper official authority. The farmer was fined 10s. with 13s. 8d. costs.

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HEALTHIER HERDS: "A UNIQUE OPPORTUNITY"

Writing in a recent issue of that paper, the Agricultural Correspondent of *The Daily Telegraph* says:—"The housewife, no less than the farmer, is affected by the serious toll of disease among livestock. It causes the loss of millions of gallons of milk and thousands of tons of meat every year—a drain we can hardly afford in peacetime and far less now. A unique opportunity for tackling the problem, however, is presented by the discussion of how herds and flocks are to be reduced owing to shortage of feeding stuffs. Farmers have been advised to weed out inferior and low-yield animals. Obviously there should be full co-operation between the farmers and the veterinary profession, and a great deal could be done to raise the health standard of livestock while the totals of the herds are being reduced.

"It is time to apply the same measures to our poultry flocks, which in the past have been prone to ailments. The 'backyard poultry,' now kept by no fewer than 800,000 people, must not prove a breeding ground for poultry disease."

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THE DAIRYING OUTLOOK

The report of the Milk Marketing Board, to be presented to the annual meeting on June 13th, records that on March 31st, 1941, there were 109,028 registered producers selling milk by wholesale, which is an increase of over 11,000 on the year, and there are 62,756 licensed retailers, which is also an increase. The policy of the Board has been to include every producer however small, and these additions to the numbers registered do not reflect an increase in milk production. On the contrary, the total production of milk is stated to be less than it was a year ago. The swing-over to dairying as a comparatively profitable enterprise which was evident in the years before the war is now being reversed as corn-growing has become more attractive, and there are several instances of large farmers giving up their dairy herds to concentrate again on arable production. Their cows are being bought eagerly at high prices up to £40 and £50 to make up numbers in other herds which normally depend on Irish heifers. The widespread outbreaks of foot-and-mouth disease in Eire have cut off all livestock imports from there this spring, and young cows are at a premium.

While it has been made abundantly clear that farms suitable for dairying should continue to produce milk to capacity in the national interest, the intensification of the ploughing campaign and the further reduction of grazing inevitably mean some reduction in dairying in the coming year. Part of the new arable land is being used for growing fodder crops such as kale, roots, oats and beans, which will maintain the dairy herds through the winter, replacing the oil-cakes and imported cereals which will not be available. But some farmers think it is unfortunate that so much emphasis was put on winter milk production.

Britain is still predominantly a grass country, and in war-time, when imported feeding-stuffs are scarce, milk can be produced most economically from summer grass, especially if the cows are grazing on young productive swards. The Ministry of Food has now recognised this to some extent by the encouragement being given this summer to cheese-making. The purpose is to build up a store of milk products in the form of cheese and preserved milk which will supplement the supplies of fresh milk next winter.

Better use is also being made of whey this year. Larger quantities are being dried for human food and calf feeding, but there is a surplus which can best be used direct for pig-feeding. Many of the cheese factories keep pigs, and they, as well as farmhouse cheesemakers, are being allowed extra cereal rations to enable them to use whey for pig-feeding. The nation cannot afford to have any milk or

milk products wasted, and if there are cases of waste arising through lack of proper local arrangements the Minister of Food should be given the facts.

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R.C.V.S. ANIMAL MANAGEMENT EXAMINATION

(*May*, 1941)

List of Successful Candidates

(*Continued from page* 317)

Glasgow:

Besant, J. B. (credit).
Boyle, J. G. S.
Brown, W.
Brownlee, J. F.
Conacher, F. I.
Corbett, Miss B.
Cullen, J. T.
Denholm, T. C.
Donald, Miss N.
Doran, G. F. P.
Forsyth, Harry.
Foster, A. H.
Gillies, R. J. M.
Jarrett, Thomas.
Johnston, J. B.
Macfarlane, I. M.
Martindale, P. D.
Mitchell, David.
Moodie, Miss M. P.
Spirman, Otto.
Stevenson, J. B.
Usher, F. J.

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ACCREDITED POULTRY SCHEME

Amendments to the existing regulations governing the Ministry of Agriculture's Accredited Poultry Breeders' Scheme are likely to be made with the object of rendering them acceptable to "the majority of desirable poultry breeders in the country."

This announcement was made by the Accredited Poultry Breeders' Federation following a conference at the Ministry of Agriculture between the Federation and a representative number of prominent breeders not at present accredited.

Mr. Cedric Hedderwick, Chairman of the Federation, said that, to obtain feeding-stuffs, poultry breeders had the choice of two systems—approval by the panels of the county war agricultural committees, or the Accredited Scheme. It was time that all breeders endeavoured to bridge the gap of difference which existed.

As a result of the conference, "outside" breeders are to form a committee to suggest alterations necessary. If a common policy can be agreed with the Federation, a joint deputation will seek Government sanction for new regulations.

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COMPULSORY TUBERCULIN TESTING?

A suggestion that future legislation might require the tuberculin-testing of all dairy cattle within a stated period is contained in the report for the year 1940 submitted at the annual meeting of the Royal Victoria Hospital Tuberculosis Trust. It would be necessary to provide attractions to farmers to clear up the many less heavily infected herds which would be discovered by this means, the report stated.

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CATCH CROPS TO MAKE THE MOST OF EVERY ACRE

"No land that can bear a crop should now stand idle," states a recently issued Ministry of Agriculture announcement, which continues: "In the normal way of arable farming there is often an interval of six months or more between the harvesting of one crop and the sowing of the next. But to-day, when maximum annual output from every available acre is vital, these 'rest periods' must be as short as possible. Catch cropping is a means of putting the land to fuller use. Catch crops are snatched between two main crops, and they may take the form of grass crops sown at the same time as a cereal, or second crops, such as cabbage or kale or mixtures of green forage crops.

"A new Growmore Leaflet, No. 65, has just been issued by the Ministry of Agriculture on this important subject. It tells how to increase output, how to increase supplies of winter keep and how to use some of these catch crops as green manure to increase the soil's fertility. It is obtainable free on application to the Ministry at Hotel Lindum, St. Annes-on-Sea, Lancs."

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NEW METHODS OF PRODUCING PROTEIN FOR ANIMAL CONSUMPTION

During war-time the normal supplies of protein imported from overseas in the form of concentrates such as linseed and cottonseed cake have become largely cut off. For some years scientists have been at work to find out possible substitutes. The production of protein at home can be increased in a number of ways, perhaps the most important being a sound system of rotational farming and the more extensive use of silage. There are, however, limits to which such expedients can be extended, and with their fullest use the vital problem of ensuring an adequate protein supply ultimately for the human population is not likely to be solved. It is especially in Germany that work has been carried out to anticipate the current emergency, and the investigations have been well recorded, so that, if desired, they can be put into application elsewhere. For example, the technique of fish farming has been well studied.[1] A fish pond is, acre per acre, a more efficient producer of protein than is good farmland. When suitably treated sewage is introduced to provide nutriment for the minute floating animals and plants on which the fish feed it is even more efficient. Probably the many disused gravel pits in the home counties could be put to this use.

Seaweed in enormous quantities could be collected from the shallow waters near our coasts without employing shipping needed for other tasks. There are some animals —for instance, Orkney sheep—which will eat seaweed. For most livestock it would be necessary to express and concentrate the juice and to remove some of the salts.

The employment of certain hormones to increase the fecundity of sheep, and probably of other animals, has now reached a practical stage, and there is much evidence available that milk production can be influenced by hormones.

It has now been shown[2] that 50 per cent. or more of the dietary protein of milking cows, growing cattle and sheep can be replaced by certain simple chemical substances containing nitrogen ("amide" substances), such as urea, glycine, ammonium bicarbonate, and ammonium acetate, which are capable of industrial synthesis. These substances cannot be utilised direct in the dietary of man, but they are metabolised by the rumenal micro-organisms which are in turn digested by the animal. The fixation of nitrogen from the air for the production of explosives played a vital part in the last war. It is not improbable that fixation of nitrogen for ultimate human consumption *via* the animal is destined to play a paramount part in this war. Already in Germany, dried beet slices, molassed bran, linseed meal, and potato flakes to which urea has been added, are being produced on a commercial scale.

It is now of prime importance that all possible methods of increasing home food production should be actively investigated. The last two methods mentioned above certainly touch in some measure upon the province of the veterinary profession. They provide a fascinating field for further investigation. To save shipping space their immediate application becomes a vital necessity. It needs no repetition that the prevention of animal disease is one valuable means of increasing protein production. It should not be beyond our capacities to extend our own activities to the wider fields implied in the indications to the above scientific discoveries that certainly interest our profession.

J. E.

[1] See "Science in War" (Penguin Special), 6d.
[2] *Nature*. (1941.) **147**. 531.